



DOCUMENT SECURITY PROTECTION ANALYSIS ASSISTANT

BACKGROUND OF THE INVENTION

[0001] The present invention relates to computer-based processes, and in particular to a system for presenting a user with a comprehensive set of security features and for assisting the user through any potential incompatibilities and/or nuances associated with selected security features in order to meet a protection goal of the user for a security document.

[0002] Security features improve customer satisfaction and allow for relatively unique product designs. Examples of such security features include, but not limited to, pantographs, screens, tamper protection, flourishes, overt authentication, covert authentication, and packaged products. In some cases, however, these features may be undesirable or even incompatible with other features. As the number of security features increases and the interplay between these features grows, selecting from among these features becomes more difficult.

[0003] Computer implemented design systems for various products are shown in a number of patents. For example, Tyler et al U.S. Pat. No. 5,523,942 discloses a computer implemented graphical user interface for receiving instructions and information relating to insurance products, and for displaying insurance proposals relating thereto. The graphical user interface has a product design section for receiving information specifying an insurance product and components. The product design section has a design grid that is a matrix, enabling input of product information, premium information and dividend information relating to a selected insurance product. The design grid enables a user to select a solve procedure and variable as the subject of the selected solve procedure. The Tyler patent does not teach a system in which effectiveness is gauged.

[0004] Ulwick U.S. Pat. No. 6,115,691 and Ulwick U.S. Pat. No. 5,963,910 disclose a computer-based system for use in evaluating and optimizing the design of a product. The system includes a series of metrics which quantify customer satisfaction with the product in a number of areas, and



permit the evaluation of a number of features and the impact which they have on customer satisfaction.

[0005] Gilmore U.S. Pat. No. 6,008,817 discloses a computer-based comparative visual assessment system, which assigns a plurality of weights to a corresponding plurality of components representing a subject, and assigns a plurality of scores to the corresponding plurality of components representing the subject. The system further determines a functional score for each of the plurality of components, determines an angle to be used for an output to the output device of a vector for each of the plurality of components, assigns the functional score to a length of the vector for each of the plurality of components, and displays the vector on the output device.

[0006] What is not shown or suggested in any of the prior-art references is a computer-based system that permits product design by selection of design features, and an assessment of how well the designed product including those design features achieves predetermined goals.

SUMMARY OF THE INVENTION

[0007] The present invention is a computer-based process that optimizes product selection by displaying various user-selectable features, evaluating the impact that each selected feature has upon the selection of other features, and suggesting choices to optimize the selection of each feature and/or a combination of features to meet a goal of a user for the product.

[0008] In one aspect, the present invention comprises a software application readable on a compatible computer system comprising a processor, memory, and a user interface. When running the software application, the system is programmed to present the user with a set of product choices and, depending upon the choices selected, to point out any potential incompatibilities associated with those selections. In those circumstances, the system recommends a course of action, which will resolve the incompatibility issues or concerns. Finally, the system displays an assessment of how well the selected features will address the desired goal of the user for the product. It is to be



appreciated that the system incorporates a library or database of information recording the relative pros and cons of each security feature for various objectives (e.g., security), and computes a weighted average of the selected security features in order to determine the above-mentioned assessment.

[0009] In another aspect, the present invention is used to optimize security features in order to meet a security and/or performance goal of a user for the security document. In this computer-based application, various user-selectable security features for a security document are presented on a computer display to a user for selection. Information about individual features may be view by clicking on the feature name, which will open a dialog box providing what the feature does along with the relative pros and cons for that feature.

[0010] The user makes feature selections by provided check boxes, radio buttons, drop down lists, and combinations thereof. Each security feature is associated with compatibility and relative rating information. When selected security features conflict or raise new questions about compatibility, the issue is presented to the user with a dialog box that requests a selection to resolve the issue. In some instances, there may not be a choice between features such as when the selection of one feature necessitates or precludes the selection of another feature. In such a case, the user is notified of this fact.

[0011] Once a set of features is selected and all conflicts are resolved, it is desirable to ascertain how successfully these features will work together to perform a specific security and/or performance goal. An assessment by which to ascertain success is obtained by calculating the sum of the relative ratings of the security features selected and presenting them to the user against a scale according to their influence on certain security and performance goals. The user can use this assessment to further revise and optimize the selection of security features in order to reach a desired protection goal for the security document.



[0012] In one embodiment of the present invention, presented is a computer-implemented method for optimizing security features designed to provide a level of security in a security document. The method comprises processing data relating to selected security features, the security features each having associated compatibility and relative rating information, and revising the selected security features to resolve any compatibility issues. The method further comprises evaluating the relative rating information of the selected security features to determine a document security rating, and presenting the document security rating.

[0013] In another embodiment of the present invention, provided is a computer-readable medium capable of instructing a processor of a computer system to perform optimization of security features designed to provide a level of security in a security document. The optimization is carried out by the steps of processing data relating to selected security features, the security features each having associated compatibility and relative rating information, and revising the selected security features to resolve any compatibility issues. The optimization further includes evaluating the relative rating information of the selected security features to determine a document security rating, and presenting the document security rating.

[0014] These and other features and objects of the present invention will be apparent in light of the description of the invention embodied herein.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] The present invention is illustrated by way of example and not limitation in the accompanying figures, in which like references indicate similar elements, and in which:

FIG. 1 is a block diagram of a conventional computing paradigm environment in which the present invention may be operated.

FIG. 2 is an illustration of a computer screen introducing a user to the features of the present inventions and for allowing the user to customize entry data.

FIG. 3 is an illustration of a computer screen presenting information to user requesting



information.

FIG. 4 is an illustration of a computer screen presenting a secure vital record example.

FIG. 5 is an illustration of an information sheet according to the present invention.

FIG. 6 is an illustration of a computer screen allowing a user to enter customer information.

FIG. 7 is an illustration of a computer screen allowing a user to narrow down security product requirements according to the present invention.

FIG. 8a is an illustration of a computer screen allowing the user to select desired security product features according to the present invention.

FIG. 8b is an illustration of a computer screen allowing the user to improve various features by resolving potential conflicts and pointing out noted issues.

FIG. 9 is an illustration of a computer screen showing the user how successful these desired product feature work together to perform a specific goal or function.

FIG. 10 is an illustration of a computer screen showing the user areas identified as deficiency in a specific level of protection.

FIG. 11 is an illustration of a report that is provided to the user regarding the relative cost of the selected security features to implement according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0016] The present invention is directed to a computer based software tool designed to present a user, such as a consultant and/or customer, with a comprehensive set of product choices, and depending on the choices selected, assist the user through any potential incompatibilities and/or nuances associated with those selections. The present invention provides on a computer screen/display a selection guide for the simple selection of desired security features for the design of a security document. After selection, the programmable computer examines those selected security features for possible incompatibilities and presents any potential problems to the user with a description of the concern. Additionally, the software application provides to the user a recommended course(s) of action to resolve the concern. Furthermore, the software application provides the user an assessment of how well the selected security features will address the desired



goal of the user for the security document.

[0017] FIG. 1 is an illustration of a computer system 100 that may adequately run the software application, generally indicated by 10, that efficiently implements a process permitting the optimization of security features in achieving a desired goal for a security document. The computer system is conventional, and generally comprises a central processing unit (CPU) 105, mass storage 110 (e.g., hard disk drive), main memory 120, and an input/output (I/O) device 130. Connected to the I/O device 130 are peripheral devices comprising input devices, such as, for example, a keyboard 140 and mouse 142, and a display 150. The computer system further comprises one or more removable media storage devices 160, and a network device 170, such as a network interface card or modem. The elements of computer system are interconnected in the conventional manner, in which each component communicates with each other via one or more system busses 190.

[0018] The removable media storage device 160 can be used to install software products, including the software application of the present invention, that are provided on a computer-readable medium 180, such as a CD-ROM, diskette, flash memory, and the like. Alternatively, through the network device 170, the software application of the present invention may be loaded/updated electronically over a network 200, such as through the Internet, or from an electronic bulletin board. The network device 170 permits the computer system to communication with other computers or servers (100a, 100b, 100c) over the network.

[0019] It is also to be appreciated that the components of the document security protection analysis assistant software may be loaded and run from as single platform or from a number of networked intelligent platforms, such as for example a computer, laptops, personal digital assistant, web-enabled cellular phone, and the like as is known. Additionally, although the computer system is illustrated as a stand-alone computer in which the software and methods described below are executed mainly from within the computer system, other computing paradigms and architectures may be used. For example, the client-server paradigm in which some functions are executed on a client



computer and others are executed on a server computer connected to the client computer via a network would also be suitable.

[0020] In the discussion to follow, the software components of document security protection analysis assistant software, which are principally relevant to the present invention, are shown for purposes of illustration as existing or residing in main memory 120. However, persons skilled in the art to which the invention relates, understand that software components are typically executed from such main memory and fetched into the main memory on an as-needed basis from other sources such as the mass memory or hard disk drive 110 or from over the network 200.

[0021] In addition, the computer system 100 includes a conventional operating system to facilitate the execution of such programs and other functions typically performed by operating systems. Accordingly, a user can configure, initiate, and control the execution of the software application 10 of the present invention on the computer system 100 in the conventional manner. Instructional materials and operational manuals may be provided to assist the user during installation and use. Once installed, the software application 10 of the present invention is booted-up by execution of the appropriate commands. It is to be appreciated that the process of the present invention is hardware and code independent, and is illustrated therefore hereafter in exemplary computer screen depictions to provide a full understanding of the invention.

[0022] Once the software application 10 is loaded and running in main memory 120, a document security protection analysis assistant designed to assist a user in understanding, designing, and/or recommending security features for a security document is provided. In the illustrative embodiment, the application 10 is implementing using Microsoft® Access, however, other database applications and/or programming languages such as, and not limited to, Visual Basic, C++, and XML (for web implementation) may be used.



[0023] The software application 10 includes two functionally different components: input forms 12 and an event handler 14. The input forms 12 accepts user inputs, such as, document security features used in evaluating specific user document security requests, and carries out actions based on user inputs, such as storing/retrieving information from a database record in a database 15. The event handler 14 includes the necessary routines for accessing the inputted/stored data, for conducting the mathematics and matrix analysis on selected security features, and for providing the assessment of the selected security features meeting a desired level of protection and function for the security document in a number of areas of concern, such as for example, attack resistance and authentication.

[0024] After launching the software application 10, an introduction form, generally indicated in FIG. 2 by reference symbol 16, allows the user to select among a number of specific subjects to assist in designing custom security documents tailored to meet specific needs of customers. For example, to familiarize the user with the need of providing security to sensitive security documents, such as for example checks, government records, and secure commercial documents, an overview in the form of a multimedia presentation may be selected for viewing from the introduction form 16. This multimedia presentation may be viewed, for example, by selecting a background button 18 using an input device such as the computer keyboard 140 or mouse 142, and the like.

[0025] The multimedia presentation, generally depicted in FIG. 3 by reference symbol 20, may include text, video, animation, sound, graphics, and any combination thereof. Additionally, if the user is unfamiliar with such security documents, examples may be selected for viewing by selecting one of the security document sample buttons 22 provided on the introduction form 16 (FIG. 2). Selecting one of the sample buttons 22 will present to the user a graphical illustration of the selected security document type.

[0026] One example of such a graphical illustration for a security document is generally depicted in FIG. 4 by reference symbol 24. Other types of security documents may be similarly illustrated, such as for example, a check, a vital record, a certificate of origin, a title, a gift certificate, a prescription, a



ticket, a label, a transcript/letterhead, or any other document where security features are useful. In the illustrated example, typical security features 26 that are associated with the displayed security document are indicated. Selecting the name of any one of the displayed security features 26 will present an information screen to the user. An example of such an information screen is generally depicted in FIG. 5 by reference symbol 28, wherein information 29 such as the function, purpose, strengths, weaknesses, and unique considerations of the selected security feature 26 is provided.

[0027] Referring again to FIG. 2, from the introduction form 16 the user may customize the reports generated by selecting a personalization button 30. Selecting the personalization button 30 will provide the user with a customization entry form, generally depicted in FIG. 6 by reference symbol 32. Entering such information results in the reports generated by the software application 10 to contain customized user information 33. As illustrated by FIG. 6, the customizable user information 33 includes contact and representative information, which is a useful feature for users discussing and developing a number of security document options for a customer.

[0028] Additionally, if desired, the user can enter related security data by selecting the related security data button 34 from the introduction screen 16 (FIG. 2). In designing a security document, it is important to understand how the security document will be used and stored, and the type of printer it will be run on. Selecting the related security data button 34 will provide the user with a design questions form, generally depicted in FIG. 7 by reference symbol 36. On the design questions form 36, the user selects questions 37 that relate to the intended security document. As illustrated, these relational questions 37 reflect the general design of the document (cut sheet, laser printable, seal type, copyable, etc.), the environment of use (alterations, user expertise, how stored, tracking, authentication, etc.), and other factors relevant to the user (cost, current losses to fraud, etc.). Answering such related security questions 37 provides document design information that enables the software application 10 to provide a more accurate assessment of security by taking into account the identified conditions that affects the security features selected for use with the intended security document. Additionally, with the above-mentioned document design information, the application

can provide better suggestions to resolve any potential issues. For example, LASER LOCK® will only be recommended in cases where the form will be used on a laser printer.

[0029] To start the security document analysis the user selects a feature protection analysis button 38 from the introduction form 16 (FIG. 2). Selecting the protection analysis button 38 will present to the user a feature selection form, generally depicted in FIG. 8a by reference symbol 40, from which the user selects the type of security document 42 and its associated security features 26. In the illustrative embodiment, the security features 26 are categorized by their purpose, wherein such categories 44 include pantographs/screens, tamper protection, overt authentication, covert authentication, and flourishes/premiums. The security document types 42 selectable from the selection form 40 include, for example, check, vital record, certificate of origin, title, gift certificate, prescription, ticket, label, transcript/letterhead, and other unspecified documents. A sample of a selected document type 42 may be viewed by clicking on the provided sample button 22. As before, clicking on the sample button 22 will bring up a sample screen 24 (FIG. 4) for the selected document type 42.

[0030] From the feature selection form 40, the user may also enter the related security data by selecting the provided security data button 34. Further, the software application 10 allows for a plurality of security document feature settings to be stored in the database 15. If the user desires to recall a saved setting, a drop-down box 46 provides a recall settings list of such saved settings from which the user may choose. The user adds to the stored settings by selecting a save settings button 48, which will record the currently selected information on the feature selection form 40, such as for example, the document type 42, documents features 44, the related security data 34, and combinations thereof, to the database 15 (FIG. 1). Accordingly, the user can maintain a library in the database 15 of various security document feature-setting arrangements.

[0031] Referring to FIG. 8a, clicking on any one of the names of the security features 26 displayed on the feature selection form 40 will open an associated information screen 28 (FIG. 5) that describes



the selected security feature in detail. It is to be appreciated that each security feature is associated with compatibility and relative rating information provided in a database record in the database 15. Such compatibility and relative rating information, along with the addition and deletion of security feature and document types, can be updated routinely through a network connection to a web site or server (not shown) providing such updates.

[0032] Other features of the software application include the ability to provide a selection recommendation of security features 26 necessary to achieve a desired security level. To use this option, the user simply selects the desired security level from a security level selection 50 and the document type 42. The software application 10 will then retrieve from the database 15, a stored security feature arrangement that pre-selects the security features 26 needed for achieving the selected level of protection for the selected document type. This automated selection process may also be updated routinely as new documents types and security features become available.

[0033] Because each security document feature 26 has associated with it compatibility information, in those circumstance when selected document features 26 raise compatibility issues with other selected or standard security features and/or desired security and performance goals, the issue is presented to the user with a resolution dialog box, generally depicted in FIG. 8b by reference symbol 49. As illustrated, the software application 10 presents to the user an explanation 51 for the conflict and provides a number of deciding security feature selections 53 which will resolve the compatibility issue or concern. In some cases, the user will have no choice in selecting between features such as when the selection of one item necessitates the selection of another feature. In such a case, the user is notified of this fact.

[0034] Once a set of security features 26 is selected on the feature selection form 40 and all conflicts have been resolved, it is desirable to ascertain how successfully these selected features will work together to perform a specific goal or function. The event handler 14 (FIG.1) runs an assessment routine on the selected features 26 and document type 42 by selecting protection



summary button 52. Once selected, the software application 10 returns a protection summary, generally depicted in FIG. 9 by reference symbol 54. As shown in the illustrated example, the protection summary 54 provides the user with an evaluation of how well these features protect the document against different forms of attacks, and provides an assessment on the relative ease of authenticating the security document.

[0035] It is to be appreciated that for each security feature, provided in the database 15 are relativistic values against tampering/alteration (tamper protection), copying/replication (copy protection), creating false originals (access protection), theft/unauthorized use (counterfeit protection), on the ease of authenticating the document at the point of acceptance (overt authentication), on the ability of hidden tools for identifying high quality counterfeits (covert authentication), on the ability to validate the document in an automated process (mechanical authentication), and on the impact of this feature on overall cost. These relative values are categorically summed, divided by a relative weight, and provided as a weighted average 56 in the protection summary under their associated protection and authentication assessment areas 58. As illustrated, the weight averages 56 can be graphically represented and/or provided with a general rating 60. Each general rating 60 is based upon the particular weighted average 56 exceeding a predetermined threshold heuristic value. As certain protection areas 58 become easier/harder to defeat, this heuristic value based on industry observations and norms may be changed accordingly. A selected feature list 61 of the security features selected and used to provide the resulting assessment is also provided by the protection summary 54.

[0036] With reference also to FIG. 10, if the software program 10 identifies a deficiency 64, such as for example, an area of the protection and authentication assessment 58 having a general rating 60 of "poor", it will post a warning that provides the cause for the deficiency. This warning is generally depicted in FIG. 10 by reference symbol 62, and unless corrected, the security features as currently selected, according to industry norms and assessment, will be unable to provide the document with adequate protection and performance in the specified protection and/or authentication area 58.



Accordingly, the software program 10 will suggest to the user possible solutions 66 for correcting the indicated deficiency along with a brief description of each solution. The user can use the protection summary 54 to further revise and tailor the selection of security features 26, optimizing their selections in meeting a security and/or performance goal for the security document.

[0037] After the user has identified all of the desired security features 26, a cost assessment, generally depicted in FIG. 11 by reference symbol 68, is viewed by selecting a cost impact summary button 70 provide on the feature selection form 40 (Fig. 8a). The cost impact summary 68 provides the user with an evaluation 72 of how the selected security features 26 affect the relative cost of the intended security document according to industry norms and assessment. It is to be appreciated that the relative cost impact summary 70 lists the evaluation 72, and the features 26 selected that may have additional support requirements 74, such as for example, special print units and/or other equipment/changes. Other remaining features of the software application 10 are explained hereafter.

[0038] Turning again back to FIG. 8a, the software application 10 enables the user to view frequently asked questions section and their teaching response by selecting a Q&A button 76 on the feature selection form 40. For example, such common concerns addressed may include cost, quantity of features needed, feature protection guarantees, chances of being defrauded, suitability of current designs, and other similar customer concerns. Additionally, once the features 26 and the security level 50 of the document have been decided, a report can be outputted, such as for example, to either a word processor application file or a local printer by clicking their associated buttons 78 and 80, respectively. The outputted report includes any customization data entered by the user into the database file 15 from the customization form 32 (FIG. 6). It is to be appreciated that an additional screen (not shown) controls the form layout, and the updating/editing of the displayed features and documents types. This screen also allows for the updating/editing of all preset data contained in the database file 15, and all the calculations/routines performed by the event handler 14. Therefore, if desired, the software application 10 may be customized advantageously to particular user needs, wherein the system may be used to provide feature selections, compatibility assessment



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and resolution, and effectiveness assessments in achieving a product goal(s) for other products.

[0039] In the foregoing specification, the invention has been described with reference to specific embodiments. However, one of ordinary skill in the art appreciates that various modifications and changes can be made without departing from the skill of the present invention as set forth in the claims below. Accordingly, the specification and figures are to be regarded in an illustrative rather than a restrictive sense, and all such modifications are intended to be included within the scope of the present invention.

What is claimed is: